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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,809	09/16/2003	Seiji Nagai	T36-159069M/KOH	1114
21254	7590	05/24/2005	EXAMINER	
MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			ANDERSON, MATTHEW A	
			ART UNIT	PAPER NUMBER
			1722	

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,809

Applicant(s)

NAGAI ET AL.

Examiner

Matthew A. Anderson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-8 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/08/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/16/03; 9/22/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 8 recites the limitation "...the second layer forming step..." in lines 12 and
13. There is insufficient antecedent basis for this limitation in the claim. Claim 8 is independent and has not reference to a second layer forming step.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1-3, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al. (US 6,824,610 B2).

Shibata et al. discloses a process for producing nitride crystal substrates for use in making light emitting devices (see Fig. 5). In Example 9, one embodiment is detailed. A silicon substrate was provided and a silver film was applied thereto as a buffer layer. A further buffer of AlN was applied. Then, a layer of GaN was grown on the AlN surface using MOCVD. After, the substrate was transferred to a HVPE furnace where a thick layer of GaN (i.e. the first layer) was deposited on the previous layer. Then the silver film was subjected to etching thus removing both the silver and the silicon substrate. Alternative materials were given in cols. 17 and 18 to include AlGaIn and GaInN as the substrate prepared.

Shibata et al. does not disclose explicitly to remove almost all of the silicon substrate by etching.

However, in respect to claims 1 and 7, it would have been obvious to one of ordinary skill in the art at the time of the present invention to produce a Group III-nitride compound semiconductor substrate (including Al containing nitrides) by HVPE on a buffered silicon substrate and then remove the silicon substrate from a rear surface by etching after the completion of the first layer forming step because such was suggested by Example 9 and col. 18 of Shibata et al. Almost the whole Si substrate is left since only the AlN/GaN buffer layer is left after the etching.

In respect to claim 2, it would have been obvious to one of ordinary skill in the art at the time of the present invention to perform a second layer forming step after the Si

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substrate removing step because Shibata et al. describes in Col. 18 lines 22-30 the use of the substrate in forming laser diodes which require further nitride film formation.

(See Fig. 5)

In respect to claim 3, it would have been obvious to one of ordinary skill in the art at the time of the present invention to remove a large part of said first Group III nitride compound semiconductor layer from the rear surface by etching after the completion of the second layer forming step because Shibata et al. suggests removing, in example 1 col. 8 lines 15-25, the rear of the substrate which has AlN thereon.

In respect to claims 5 and 6, it would have been obvious to one of ordinary skill in the art at the time of the present invention to optimize the result dependent process parameters of temperature and film thickness because these parameters were described throughout Shibata et al. and the applicant has provided no proof that these were critical.

Allowable Subject Matter

6. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The closest prior art of Shibata et al. does not suggest forming an etch stop layer containing a larger amount of aluminum than an amount of aluminum contained in each of the first and second Group III-nitride compound semiconductor layers on the nitride

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substrate before the second layer forming step where the first layer removing step completely removes the first Group III nitride compound semiconductor layer.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Anderson whose telephone number is (571) 272-1459. The examiner can normally be reached on M-F, 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (571) 272-1137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAA
May 19, 2005


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SUPERVISORY PATENT EXAMINER
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